furnace, air handler, blower kit), the manufacturer's model number of this ducted air mover must be included among the model numbers listed on the certification report.

(ii) Residential central air conditioning heat pumps: The seasonal energy efficiency ratio (SEER in British thermal units per Watt-hour (Btu/W-h)), the cooling capacity in British thermal units per hour (Btu/h), the heating seasonal performance factor (HSPF in British thermal units per Watt-hour (Btu/W-h)), and the manufacturer and individual model numbers of the indoor and outdoor unit. For central air conditioning heat pumps whose seasonal energy efficiency ratio and heating seasonal performance factor are based on an installation that includes a particular model of ducted air mover (*e.g.*, furnace, air handler, blower kit), the model number of this ducted air mover must be included among the model numbers listed on the certification report.

(iii) Small duct, high velocity air conditioners: The seasonal energy efficiency ratio (SEER in British thermal units per Watt-hour (Btu/W-h)) and the cooling capacity in British thermal units per hour (Btu/h).

(iv) Small duct, high velocity heat pumps: The seasonal energy efficiency ratio (SEER in British thermal units per Watt-hour (Btu/W-h)), the heating seasonal performance factor (HSPF in British thermal units per Watt-hour (Btu/W-h)), and the cooling capacity in British thermal units per hour (Btu/h).

(iv) Space constrained air conditioners: The seasonal energy efficiency ratio (SEER in British thermal units per Watt-hour (Btu/W-h)) and the cooling capacity in British thermal units per hour (Btu/h).

(v) Space constrained heat pumps: The seasonal energy efficiency ratio (SEER in British thermal units per Watt-hour (Btu/W-h)), the coefficient of performance, and the cooling capacity in British thermal units per hour (Btu/h).

(c) *Alternative methods for determining efficiency or energy use* for central air conditioners and heat pumps can be found in § 429.70 of this subpart.

[76 FR 12451, Mar. 7, 2011; 76 FR 24763, May 2, 2011]

§ 429.17 Residential water heaters.

(a) *Determination of represented value.* Manufacturers must determine the represented value, which includes the certified rating, for each basic model of residential water heater either by testing, in conjunction with the applicable sampling provisions, or by applying an alternative efficiency determination method (AEDM) approved for use by DOE.

(1) *Units to be tested.* (i) If the represented value is determined through testing, the general requirements of § 429.11 are applicable; and

(ii) For each basic model selected for testing, a sample of sufficient size shall be randomly selected and tested to ensure that—

(A) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and x_i is the i^{th} sample;

Or,

(*2*) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.10, where:

$$UCL = \bar{x} + t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

and

(B) Any represented value of the energy factor or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and x_i is the i^{th} sample;

Or,

(*2*) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.90, where:

$$LCL = \bar{x} - t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(C) Any represented value of the rated storage volume must be equal to the mean of the measured storage volumes of all the units within the sample.

(D) Any represented value of first-hour rating or maximum gallons per minute (GPM) must be equal to the mean of the measured first-hour ratings or measured maximum GPM ratings, respectively, of all the units within the sample.

(2) *Alternative efficiency determination methods.* In lieu of testing, represented values for a basic model must be determined through the application of an AEDM pursuant to the requirements of § 429.70.

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to residential water heaters; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: The uniform energy factor (UEF, rounded to the nearest 0.01), rated storage volume in gallons (gal), first-hour rating or maximum gallons per minute (GPM), and recovery efficiency (percent).

[76 FR 12451, Mar. 7, 2011; 76 FR 24764, May 2, 2011, as amended at 79 FR 40565, July 11, 2014]

§ 429.18 Residential furnaces.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of